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**WQD7001 PRINCIPLES DATA SCIENCE
TUTORIAL 4**

1. FCSIT , UME wishes to improve the existing undergraduate programme to increase the visibility, and increase number of graduate employability. Currently the specialization offered are Information Systems, Artificial Intelligence, Computer System and Networking, Software Engineering, Multimedia Computing and Data Science. What would be the right questions to ask in determining the improvement needed for the programme?
 - Questions to ask can be formed in various categories, including descriptive, exploratory, inferential, predictive, causal and mechanistic. In this context, the most relevant categories would be descriptive and exploratory.
 - Descriptive:
 1. What specific skill is highly in demand in the market for fresh graduates?
 2. What tools / language is the most popular in the industry?
 3. Amongst the different specializations, which one has the lowest percentage of graduate employability?
 4. Amongst the different specializations, which one has the lowest number of students?
 - Exploratory:
 1. What is the correlation between each subject and the graduate employability, does certain subject translates to higher graduate employability?
 2. Do subjects that are updated more regularly have higher correlation with graduate employability than subjects that are outdated?
 3. Is there an increase in student intakes for specialization that are relatively newer?
2. “A problem well defined is a problem half-solved” – Charles Kettering (Charles Fredrick Kettering was an American inventor, engineer, businessman, and the holder of 186 patents. He was a founder of Delco, and was head of research at General Motors from 1920 to 1947)

Refer to the following scenario:

Thousands of Universiti Malaya (UM) students have apparently failed to secure campus accommodations, in what is believed to be the education institution’s worst ever hostel shortage.

The University of Malaya Association of New Youth (Umany) said a high number of students from B40 households with high merit points were similarly overlooked, triggering dissatisfaction among various quarters.

The failed applications for hostel accommodation of close to 9,000 students require immediate attention, and the university must respond to the matter, Umany said in a statement.

Discuss the root cause and problem of the above scenario. Is the problem well-defined? What would be plausible questions to ask in order to find a right solution?

- No, the problem is not well-defined, as it only mentions the fact that 9,000 students were not able to find accommodation, and attempted to link it with B40 households with high merit points, which does not seem to have any correlation.
 - The plausible questions to ask would be:
 1. Why is there a shortage of campus accommodation, is it because the accommodation allocation has always been insufficient, or is it that the university has gradually increased the admitted number of students.
-> Q: Is there an increase in number of admitted students, while the number of accommodation remains the same?
 2. Is the number of students that overstayed their allowed duration high, which could potentially cause the friction in providing accommodation to newer students?
-> Q: What is the proportion of student that overstayed their allowed duration?
 3. Are students coming from B40 background the ones that require more assistance in terms of affordable accommodation?
-> Q: What is the distribution of the demographics that is staying in campus accommodation?
3. Let's say KFC is considering opening a new branch, in a new housing development area. What would be the factors considered? What are the appropriate questions that need to be asked?
- The factors considered would be:
 - Population of the area
 - Current competitors
 - Ease of logistic
 - Demand for KFC
 - Appropriate questions:
 - What would the mean or median population be for KFC to open a new branch, is the current proposal below or above this metric.
 - How does the demographic look like for a KFC with high volume of sales, and how does the proposed one compared to the metric.
 - What is the performance in sale for previous KFC that has competitors around it. When a new competitor opens beside the KFC, would the sale increase or decrease?